CLAIMS

1. A method for operating a network having a plurality of nodes comprising:

generating status messages at each node of said network, said status messages each including at least a node identification and a message age;

periodically transmitting said status messages from each node of said network;

receiving said status messages at each node of said network;

aging said status messages at each node of said network; and

retransmitting said aged status messages at each node of said network.

2. A method for operating a network as claimed in claim 1 wherein periodically transmitting said status messages from each node of said network is performed approximately once every millisecond.

3. A method for operating a network as claimed in claim 1 wherein periodically transmitting said status messages from each node of said network is automatically performed by network logic.

4. A method for operating a network as claimed in claim 1 further comprising:

connecting at least one node within said network as a monitor node;

receiving said status messages at said at least one monitor node; and

monitoring said network using said status messages received by said at least one monitor node.

5. A method for operating a network as claimed in claim 1 further comprising removing status messages from said network at nodes having the same node identifications as said status messages.

6. A method for operating a network as claimed in claim 5 further comprising using the age of status messages removed by each node as a node age.

7. A method for operating a network as claimed in claim 6 further comprising determining the size of said network based on said node age.

8. A method for operating a network as claimed in claim 7 wherein said message age is set to zero upon generation, aging said status messages comprises incrementing said message age by one and the size of said network is equal to the node age plus one.

9. A method for operating a network as claimed in claim 8 further comprising storing said node statuses at each node of said network at addresses corresponding to ages associated with said node statuses with said node age corresponding to the highest valid stored node status.

10. A method for operating a network as claimed in claim 1 further comprising storing node statuses from said status messages at each node of said network.

11. A method for operating a network as claimed in claim 10 wherein storing node statuses comprises storing a data valid indicator.

12. A method for operating a network as claimed in claim 10 further comprising determining the structure of said network from said stored node statuses.

13. A method for operating a network as claimed in claim 12 wherein said network comprises N nodes and determining the structure of said network from said stored node statuses comprises:

determining a node that is a distance one upstream from a given node by using the node identification of the node status corresponding to an initial message age; and

if N > 2, determining additional nodes that are distances two through N from said given node by using the node identifications of the node statuses corresponding to said initial message age that has been aged by one through N-1.

14. A method for operating a network as claimed in claim 12 wherein determining the structure of said network from said stored node statuses comprises:

reading said stored node statuses;

identifying an immediately adjacent, first upstream node by the node identification of the node status corresponding to an initial message age; and

identifying any additional upstream nodes by the node identifications of the node statuses corresponding to said initial message age that has been aged by said additional upstream nodes.

15. A method for operating a network as claimed in claim 12 wherein determining the structure of said network from said stored node statuses comprises:

reading said stored node statuses;

identifying said network as comprising N nodes where N is the number of node statuses that have been stored and read;

identifying an immediately adjacent, first upstream node by the node identification of the node status corresponding to an initial message age; and

if N > 2, identifying any additional upstream nodes by the node identifications of the node statuses corresponding to said initial message age that has been aged by said additional upstream nodes.

16. A method for operating a network as claimed in claim 10 wherein storing said node statuses at each node of said network comprises storing said node statuses at each node at addresses corresponding to ages associated with said node statuses.

17. A method for operating a network as claimed in claim 16 further comprising determining the structure of said network from said stored node statuses.

18. A method for operating a network as claimed in claim 17 wherein said network comprises N nodes and determining the structure of said network from said stored node statuses comprises:

determining a node that is a distance one upstream from a given node by reading the node identification of the node status stored at an address corresponding to an initial message age; and

if N > 2, determining additional nodes that are distances two through N from said given node by reading the node identifications of the node statuses stored at addresses corresponding to said initial message age that has been aged by one through N-1.

19. A method for operating a network as claimed in claim 17 wherein determining the structure of said network from said stored node statuses comprises:

reading said stored node statuses;

identifying an immediately adjacent, first upstream node by the node identification of the node status stored at an address corresponding to an initial message age; and

identifying any additional upstream nodes by the node identifications of the node statuses stored at addresses corresponding to said initial message age that has been aged by said additional upstream nodes.

20. A method for operating a network as claimed in claim 17 wherein determining the structure of said network from said stored node statuses comprises:

reading said stored node statuses;

identifying said network as comprising N nodes where N is the number of node statuses that have been stored and read;

identifying an immediately adjacent, first upstream node by the node identification of the node status stored at an address corresponding to an initial message age; and

if N > 2, identifying any additional upstream nodes by the node identifications of the node statuses stored at addresses corresponding to said initial message age that has been aged by said additional upstream nodes.

21. A method for operating a network as claimed in claim 10 wherein said status messages and corresponding node statuses further include data representative of operational characteristics of their corresponding nodes, said method further comprising determining the status of said network from said stored node statuses.

22. A method for operating a network as claimed in claim 21 wherein said data representative of the operational characteristics of their corresponding nodes comprises at least one node characteristic selected from the following group: an immediately upstream node identification; status of data transmission; status of data reception; status of network retransmission; status of network link; redundant link status; and, data valid.

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23. A network having a plurality of nodes, each node comprising:

logic for generating status messages each including at least a node identification and a message age;

logic for periodically transmitting said status messages;

logic for receiving said status messages at each node of said network;

logic for aging said status messages at each node of said network; and

logic for retransmitting said aged status messages at each node of said network.